



US010274995B2

(12) **United States Patent**  
**Seo et al.**

(10) **Patent No.:** **US 10,274,995 B2**  
(45) **Date of Patent:** **Apr. 30, 2019**

(54) **ROLLABLE DISPLAY DEVICE**

(56) **References Cited**

(71) Applicant: **Samsung Display Co., Ltd.**, Yongin-si (KR)

U.S. PATENT DOCUMENTS

(72) Inventors: **Tae An Seo**, Hwaseong-si (KR); **Sun Ho Kim**, Seongnam-si (KR); **Jung Hun Lee**, Hwaseong-si (KR); **Jin Hwan Choi**, Seoul (KR)

8,493,726 B2 \* 7/2013 Visser ..... G06F 1/1601  
361/679.05  
2002/0070910 A1 \* 6/2002 Fujieda ..... G06F 1/1615  
345/85  
2005/0040962 A1 \* 2/2005 Funkhouser ..... G06F 1/1601  
340/815.4  
2006/0007368 A1 \* 1/2006 Slikkerveer ..... G09F 9/35  
349/58

(73) Assignee: **Samsung Display Co., Ltd.**, Yongin-si (KR)

(Continued)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **15/674,467**

KR 10-2014-0108825 9/2014  
KR 10-2014-0131741 11/2014  
KR 10-2015-0063876 6/2015

(22) Filed: **Aug. 10, 2017**

*Primary Examiner* — Yuriy Semenenko

(65) **Prior Publication Data**  
US 2018/0059727 A1 Mar. 1, 2018

(74) *Attorney, Agent, or Firm* — H. C. Park & Associates, PLC

(30) **Foreign Application Priority Data**  
Aug. 29, 2016 (KR) ..... 10-2016-0110218

(57) **ABSTRACT**

(51) **Int. Cl.**  
**H05K 1/00** (2006.01)  
**G06F 1/16** (2006.01)  
(52) **U.S. Cl.**  
CPC ..... **G06F 1/1652** (2013.01); **G06F 1/1643** (2013.01); **G06F 1/1656** (2013.01)  
(58) **Field of Classification Search**  
CPC ..... G06F 1/1643; G06F 1/1652; G06F 1/1656  
See application file for complete search history.

A rollable display device includes: a panel supporting portion including a plurality of supporters arranged in substantially parallel relationship and a plurality of hinge linking portions rotatably connecting adjacent supporters to one another, and having rolled and unrolled configurations; a flexible display panel having a display area disposed on the panel supporting portion and a non-display area outside the display area; and a driving module including a flexible circuit board having a bent portion and connected to the non-display area, and a printed circuit board (PCB) connected to the flexible circuit board. The plurality of supporters includes a housing disposed at an outermost side of the rollable display device. The housing has a hole through which the non-display area passes and a chamber communicating with the hole and receiving the driving module. A sealant is disposed between the flexible display panel and the housing at the outside of the hole.

**20 Claims, 14 Drawing Sheets**

